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WOODS, ERIC V	
ART UNIT	**PAPER NUMBER**
2628	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/690,918	KLOCK ET AL.
	Examiner	Art Unit
	Eric Woods	2628

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8 and 10-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8 and 10-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9 November 2005 (RCE filed 9 January 2006) has been entered.

Response to Arguments

Applicant's arguments, see Remarks pages 1-3 and the amendments to the claims, filed 9 January 2006, with respect to the rejection(s) of claim(s) 1-6, 8, and 10-32 under various statutes, particularly 35 USC 103(a) have been fully considered and are persuasive.

Therefore, in view of applicant's amendments to the claims, the rejection of claims 1-6, 8, and 10-32 under 35 USC 103(a) has been withdrawn.

However, upon further consideration, a new ground(s) of rejection is made in view of various references below. .

The recitation of the term 'automatically' to the retrieval of data is only automation of a task previously done manually, e.g. instead of the user manually selecting the file the computer selects it instead. This is clearly merely automating a task previously done manually, and thusly is rejected is an obvious expedient as per In re Venner, 262 F.2d 91, 95, 120 USPQ 193, 194 (CCPA

1958), where the court held that broadly providing an automatic or mechanical means to replace a manual activity which accomplished the same result is not sufficient to distinguish over the prior art, where the 'automated' retrieval of data would be no different than the timer means introduced to control the release of the engine piston, because in this case the file is being retrieved as part of a human activity, e.g. the use of the input device, which proves clearly that the automation is still triggered by a human being, clearly meeting the criteria under *Venner*.

A closer reading of the relevant case law, namely *In re Venner* shows that simply because a computer (or broadly, "automated means", which in the case of *Venner* happened to be a timer) is used to perform a step previously performed by a human being (in *Venner*, the step was determining when to release the relevant engine part from the mold) does not make it patentable or non-obvious (see MPEP 2106 and specifically 2144.04, section (III)). Further, the obviousness rejection in that case was upheld at least partially because the user of the system still had to choose the point at which the timer was initiated, so even though automatic means were used to release the mold, the user still had to initiate the process. Therefore, on both grounds - both broadly that automatically positioning views as applicant recites is merely automating an activity previously manually done by a user is *per se* only automating a previously manual activity, and that specifically in respect to *Venner*, that the present step is still **initiated** by the user at a time of the user's choosing, and the user chooses which parameters will be optimized, and (although the claim does

not specifically say so) the user (as is well known in the PC art) can / could choose the parameters to be optimized **and their ranges** as applied to the graphics card in question. As such, the activity is still manual in nature, with only a small step converted to an automatic action by a computer, as applicant clearly admits on page 1 of the Remarks states that a user operating a general-purpose computer could in fact perform all the steps, but then asserts that having the user set up and test a matrix of overclocking parameters has several problems.

However, to sustain a holding of obviousness it is only necessary that the automation occur, **not** whether or not the automation of several tedious tasks, irrespective of the merits of such automation, unless there is either a) special circumstance or b) some new invention in the automation itself. Applicant has submitted no documentation in the specification or otherwise that would justify a holding of special circumstances (e.g. long-felt need, commercial success, and/or unexpected results).

Therefore, the conclusion that one of ordinary skill in the computer art, which in this case would be assumed to be someone of at least a bachelor's degree in computer engineering or science with a focus on computer graphics (justified because it is reasonable to hold that the minimum educational background to become a patent examiner in an art area would be necessary to be qualified as 'one of ordinary skill') would find it expedient to write a program or the like perform those steps (e.g. to automate them) is justified. Note that the Kao reference teaches partial automation of such testing (e.g. an automatic test).

The Kao reference thusly validates the holding that such testing is well

known in the art.

Thusly, examiner has shown two prongs of obviousness – both that such automatic testing is well known in the art and that such modification would have been obvious, both in light of legal precedent and the fact that other references teach in that direction.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, as stated above, both the Kao reference and legal precedent support that argument.

The Bigjakkstaffa does not teach away from the claimed invention as applicant states. It merely teaches a user performing steps manually, which applicant concedes on page 1.

Finally, it is well known to anyone in the art that automating tasks is beneficial (*Venner*), but not a patentable advance (also see *Venner*). Examiner's holding is further supported by the common sense holding that automating tasks is a trivially obvious and notoriously well known expedient to improve productivity and the like (but not patentable).

Applicant is put on notice that the rejections of ALL independent claims incorporate the rejection to claim 1 by reference in its entirety below. Therefore, please read that rejection for an explanation of the rejection for the newly added limitations.

Also, Bigjakkstaffa very clearly teaches testing for **pixel** errors by monitoring the number of texture tears and/or visual artifacts, which **clearly** constitute pixel errors.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 28 is rejected under 35 U.S.C. 101 because it is directed to non-statutory subject matter. Specifically, the claim is directed to a software driver module, which is software per se. This is therefore an abstract idea and is rejected. A claim that is broad enough to read on software per se is properly rejected as directed to non-statutory subject matter (see *In re Warmerdam* as an example).

In order to expedite prosecution, the claims rejected above under 35 USC 101 as non-statutory are further variously rejected under 35 USC 112, 102, and/or 103 as set forth below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-6, 10-17, and 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bigjakkstaffa (http://www.sysopt.com/articles/VCOGuide/) in view of Bruno et al (US PGPub 2005/0071705 A1) and Kao (US 6,622,254). .

As to claim 1,

A computer implemented method of overclocking a graphics system, comprising: (Preamble is not given patentable weight, since it only recites a summary of the claim and/or an intended use, and the process steps and/or apparatus components are capable of standing on their own; see Rowe v. Dror, 112 F.3d 473, 42 USPQ2d 1550 (Fed. Cir. 1997), Pitney Bowes, Inc. v. Hewlett-Packard

Co., 182 F.3d 1298, 1305, 51 USPQ2d 1161, 1165 (Fed. Cir. 1999), and the like.)

-Receiving a user request for overclocking; (Bigjakkstaffa, the overclocking menu tab on page 3, and see page 5, first paragraph, wherein the user requests overclocking by ticking the checkbox marked "Enable driver level hardware overclocking" near the top of the window)(Kao – user requests overclocking – Abstract, 2:1-65)

-Forming sets of overclocking parameters to be evaluated, each set of overclocking parameters having at least one overclocking parameter that is unique and which is associated with at least one of a graphics processor and a graphics memory; (Bigjakkstaffa, pages 5 and 6, wherein the overclocking parameters to be evaluated are the clock of the GPU core and the clock of the GPU memory, where the user can clearly vary the setting of each; indeed, Bigjakkstaffa teaches on page 3 that each parameter can be varied independently, whilst teaching on page 6 that both can be varied simultaneously and/or independently, note that the **stock** referred speeds on page 5 have are 250MHz/513MHz, which have a ratio of 2.052:1, where Bigjakkstaffa then recommends changing them in increments of 10MHz, which would change the ratio between them accordingly. Next, the idea of varying them individually is discussed by Bigjakkstaffa in page 8, where a final overclocked graphics card is shown as having speeds of 280MHz/600MHz, which has a ratio of 2.143:1 (page 9), where the overall memory speed is then suggested to be lowered 20MHz (by itself). Therefore, for at least all the above reasons, both memory speed and

graphics core speed can be adjusted independently and such adjustment is taught and/or suggested. These parameters are unique to the components in question. Now, the concept of different sets of parameters can be represented as different groupings of parameters tried by the user (e.g. 10MHz stepped intervals suggested above))(Bruno clearly teaches the formation of a variety of sets of data concerning performance (overclocking – Abstract), where a variable (processor speed / clock rate) is changed based on whether or not a tested parameter (temperature) is lower than a set parameter threshold (lower junction temperature threshold) or greater than another one (upper junction temperature threshold))(Kao forms sets of overclocking parameters to be tested, where these comprise speeds for the front side bus and processor)

-For each set of overclocking parameters, automatically applying a stress test, said stress test including executing a graphics test sequence and monitoring pixel errors of said graphics system; and (Bigjakkstaffa, pages 6 and 7, wherein the user clicks on the "test" button, and wherein further tests are performed by running a 3dmark bench, and if no visual artifacts or texture tearing appears, then the user defined GPU core and GPU clock speeds pass the test and are determined to be a safe set of overclocking parameters. Bigjakkstaffa inherently performs graphics test sequences and monitors texture tearing and visual artifacts, except that the user is doing so. The rationale for modifying Bigiakkstaffa to cover the 'automatic' limitation is given above in the Response to Arguments section and is incorporated by reference)(Bruno clearly teaches automated monitoring of the graphics processor. The results of various threshold

tests are stored in the graphics card so that it knows what the maximum safe overclocking speed or frequency is for any given temperature (Abstract), and clearly teaches maximizing performance by changing the frequency and overclocking the graphics system [0014-0016].)(Kao tests whether or not the system boots successfully after testing a series of parameters)

-Automatically determining a safe set of overclocking parameters passing said stress test wherein said set of overclocking parameters passes said stress test if the number of pixel errors is below a threshold level. (Bruno teaches the idea of determining a safe set of overclocking parameters (Abstract, [0014-0016], [0046-0050], and particularly [0036], where the idea of determining safe operating ranges through trial and error during qualification is discussed). Next, such determination can be automatic and the results coded into the processor (e.g. by the use of an algorithm to compute the values, and then the storage of such data in a lookup table for the processor, as taught in [0036], where is an automatic test. Such sets of parameters are successful if they do not cause the system to go into thermal runaway or the like, and such sets are stored in the lookup table. Therefore, clearly Bruno establishes a safe set of overclocking parameters if the variable / parameter (temperature) is below a threshold level (conservative temperature safety margin as in [0035-0037, particularly 0036].)(Bigjakkstaffa clearly teaches the determination of a threshold condition, e.g. a lack of texture tearing or visual artifacts.)(Kao teaches the idea of determining a safe set of parameters - 2:1-65)

Bigjakkstaffa teaches most of the limitations of the instant claim. However, Bigjakkstaffa fails to explicitly teach the use of automatic testing of sets of parameters and then determining if a set of overclocking parameters passes said stress test if the number of pixels errors is below a threshold level. Bigjakkstaffa does teach determining the number of texture tears and/or visual artifacts as measurements of whether or not the overclocking is successful.

Bigjakkstuffa describes counting pixel errors and incrementing said clock rate comprises incrementing said clock rate until a number of pixel errors exceeds a pre-selected number of pixel errors (see Bigjakkstaffa, page 8, last paragraph, wherein the clock rate is incrementally increased to form a new set of overclocking parameters, and a stress test in the form of games and benchmarks are performed at the new clock rate, and further wherein when the test exceeds a preselected number of errors, in this case at least one such as a graphical glitch or a showing of colored dots/pixels, then the clock rate is no longer incremented),

Bigjakkstuffa describes executing a test program sequence of graphical operations; and determining a number of pixel errors generated by a graphics pipeline of said graphics system; wherein said set of overclocking parameters passes said stress test if said number of pixel errors is no greater than a preselected number of pixel errors (see Bigjakkstaffa, page 8, last paragraph, wherein the clock rate is incrementally increased to form a new set of overclocking parameters, and a stress test in the form of games and benchmarks are performed at the new clock rate, and further wherein when the test exceeds a

preselected number of errors, in this case at least one such as a graphical glitch or a showing of colored dots/pixels, then the clock rate is no longer incremented

Bruno teaches a method of testing a graphics card for overclocking such that different sets of parameters and tried and the system can adjust the operating frequency such that it is optimal for maximum performance given the situation, and suggests that such testing can be done by trial and error via algorithm when the card is being set up. Kao teaches a system for automatically determining the safe set of operating parameters for a central processing unit and then storing them if they are safe.

Clearly, both Bruno and Kao teach the idea of testing a processor to see if the overclocking operation has been successful or not (in the case of Bruno, the temperature is tested to determine the maximum frequency it can be assigned, whereas with Kao the ability of the system to boot successfully is tested to determine the maximum successful operating frequency, where a base number is chosen and the values of the frequencies of operation are progressively incremented until the maximum sustainable speed is found, and such parameters are stored to the memory.

As noted in the response to Argument section above (which is incorporated by reference), Kao teaches that automatic testing is well known in the art, and such testing is obvious anyway in light of *In re Venner* as pointed out in the last Office Action.

Bruno is brought in as additional evidence of testing a graphics card to have thresholds for safe and/or desired operating results while it is overclocked.

As noted above, the Kao and Bruno references teach the idea of testing sets of overclocking parameters and finding a set where the number of errors (temperature for Bruno and booting ability for Kao) are below a certain problem threshold. It would be obvious to one of ordinary skill in the art at the time the invention was made that quantifying the pixel errors of Bigjakkstaffa (e.g. using the computer to count torn textures and/or pixels errors and/or visual artifacts) would be fast and effective.

Both Kao and Bruno teach the concept of testing sets of overclocking parameters to find the maximum acceptable value below a threshold.

Kao is an analogous art. It is well established in the art that a graphics-processing unit is simply a CPU with certain optimizations, and it is further well known in the art that the processing capabilities of the GPU can be used to augment those of the CPU, where any techniques that are applicable to overclocking a CPU are equally applicable to a GPU. Examiner takes Official Notice of the above fact, and a reference will be provided upon request.

Bruno is an analogous art, since it relates to overclocking graphics cards in a safe manner.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to automate the testing of Bigjakkstaffa as per *In re Venner* and the other references, since it is faster and easier than doing the tests manually (see Kao Abstract, 1:5-2:65). Further, it would have been obvious to one of ordinary skill in the art to have a certain threshold of acceptable video quality (as Bigjakkstaffa teaches that at some point, the video will simply lock up,

and then the card needs to be scaled back). Bruno teaches that cards should be overclocked to the maximum safe frequency given certain criteria, but maintains a conservative approach to avoid permanent damage to the card (Kao does the same thing). As such, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the user would set a threshold of acceptable quality for number of texture tears and visual artifacts, and that the computer could/would automatically run the benchmarks (either the 3Dspec benchmarks or the driving game mentioned in Bigjakkstaffa). Again, motivation for having the threshold would be obvious from above – it is desirable that the video card and/or graphics card be protected from thermal runaway and/or permanent damage.

With regard to claim 2, Bigjakkstaffa describes adjusting a clock rate of a clock of said graphics system (see Bigjakkstaffa, pages 5 and 6, wherein the overclocking parameters being adjusted by the user are the clock of the GPU core and the clock of the GPU memory).

With regard to claim 3, Bigjakkstaffa describes adjusting a graphics processor core clock rate (see Bigjakkstaffa, pages 5 and 6, wherein the overclocking parameters being adjusted by the user are the clock of the GPU core and the clock of the GPU memory).

With regard to claim 4, Bigjakkstaffa describes adjusting a graphics memory clock rate (see Bigjakkstaffa, pages 5 and 6, wherein the graphics

memory clock rate adjusted is the clock of the GPU memory, or graphics memory).

With regard to claim 5, Bigjakkstaffa describes adjusting at least one clock rate to form at least one new clock rate (see Bigjakkstaffa, page 6, wherein the user adjusts at least one clock rate to form at least one new clock rate by dragging the core clock and memory clock sliders up in 10Mhz increments); and setting at least one of a chip voltage, memory timing, or a fan speed for each said at least one new clock rate (see Bigjakkstaffa, page 6, wherein the memory timing of the GPU memory is inherently set when the memory clock sliders are adjusted).

With regard to claim 6, incrementing a clock rate of said graphics system to form new sets of overclocking parameters; and applying said stress test for each incremental increase in said clock rate; said clock rate incremented until a number of errors associated with said stress test exceeds a preselected number of errors (see Bigjakkstaffa, page 8, last paragraph, wherein the clock rate is incrementally increased to form a new set of overclocking parameters, and a stress test in the form of games and benchmarks are performed at the new clock rate, and further wherein when the test exceeds a preselected number of errors, in this case at least one such as a graphical glitch or a showing of colored dots, then the clock rate is no longer incremented).

With regard to claim 10, Bigjakkstaffa describes selecting a maximum safe clock rate of a graphics processing unit (see Bigjakkstaffa, page 8, last paragraph, wherein the clock rate of a GPU is incrementally increased to form a

new set of overclocking parameters, and a stress test in the form of games and benchmarks are performed at the new clock rate, and further wherein when the test exceeds a preselected number of errors, in this case at least one such as a graphical glitch or a showing of colored dots, then the clock rate is no longer incremented, instead, the clock rate is decremented and selected by the user to the last stable clock rate which is the maximum safe GPU clock rate).

With regard to claim 11, Bigjakkstaffa describes selecting a maximum safe clock rate of a graphics memory (see Bigjakkstaffa, page 8, last paragraph, wherein the clock rate of a graphics memory is incrementally increased to form a new set of overclocking parameters, and a stress test in the form of games and benchmarks are performed at the new clock rate, and further wherein when the test exceeds a preselected number of errors, in this case at least one such as a graphical glitch or a showing of colored dots, then the clock rate is no longer incremented, instead, the clock rate is decremented and selected by the user to the last stable clock rate which is the maximum safe memory clock rate).

With regard to claim 12, Bigjakkstaffa describes receiving a user request for overclocking (see Bigjakkstaffa, the overclocking menu tab on page 3, and see page 5, first paragraph, wherein the user requests overclocking by ticking the checkbox marked "Enable driver level hardware overclocking" near the top of the window) of at least one of a graphics processor and a graphics memory (see Bigjakkstaffa, pages 5 and 6, wherein the overclocking parameters to be overclocked are the clock of the GPU core and the clock of the GPU memory); adjusting a clock rate of at least one clock of said graphics system (see

Bigjakkstaffa, pages 5 and 6, wherein the overclocking parameters being adjusted by the user are the clock of the GPU core and the clock of the GPU memory); for each new clock rate, applying a stress test, said stress test including executing a graphics test sequence and monitoring errors generated in response to execution of said graphics test sequence (see Bigjakkstaffa, pages 6 and 7, wherein the user clicks on the "test" button, and wherein further tests are performed by running a 3dmark bench, and if no visual artifacts or texture tearing appears, then the user defined GPU core and GPU clock speeds pass the test and are determined to be a safe set of overclocking parameters); determining a maximum clock rate for each of said at least one clock for which said graphics system has a number of errors below a threshold level; and setting said at least one clock rate at said maximum clock rate(s) (see Bigjakkstaffa, page 8, last paragraph, wherein the clock rate is incrementally increased to form a new set of overclocking parameters, and a stress test in the form of games and benchmarks are performed at the new clock rate, and further wherein when the test exceeds a preselected number of errors, in this case at least one such as a graphical glitch or a showing of colored dots, then the clock rate is no longer incremented, instead, the clock rate is decremented to the last stable clock rate which is the maximum clock rate(s)).

Both Kao and Bruno teach incrementing the performance or clock frequency upwards until it reaches some point where it destabilizes, has too many errors, will not boot, overheats, or the like (or is within a conservative safety margin of that (Bruno [0037])).

The rationale for modifying Bigiakkstaffa to cover the 'automatic' limitation is given above in the Response to Arguments section and is incorporated by reference.

This claim is very close to the rejection of claim 1, which is automatically incorporated by reference, including the newly cited and used references.

With regard to claim 13, Bigjäkkstaffa describes receiving an input from a control panel of a graphical user interface (see Bigjakkstaffa, page 6, wherein the system tweaks control panel, specifically the overclocking tab, receives user input when the user drags the core clock and memory clock sliders).

With regard to claim 14, Bigjakkstaffa describes displaying said graphical user with updated overclocking parameters (see Bigjakkstaffa, page 8, last paragraph, and page 9, wherein the updated overclocking parameters of page 8 are shown by the overclocking control panel on page 9).

The rationale for modifying Bigiakkstaffa to cover the 'automatic' limitation is given above in the Response to Arguments section and is incorporated by reference.

With regard to claim 15, Bigjakkstaffa describes incrementing a core clock rate of a graphics processing unit rate (see Bigjakkstaffa, page 6, which describes incrementing a core clock rate of a graphics processing unit by dragging the core clock slider up in 10Mhz increments).

With regard to claim 16, Bigjakkstaffa describes incrementing a memory clock rate of a graphics memory (see Bigjakkstaffa, page 6, which describes

incrementing a memory clock rate of a graphics processing unit by dragging the memory clock slider up in 10Mhz increments).

With regard to claim 17, Bigjakkstaffa describes incrementing a first clock rate by a first preselected increase in clock rate (see Bigjakkstaffa, page 6, which describes incrementing a core clock rate of a graphics processing unit by dragging the core clock slider up in preselected 10Mhz increments); and incrementing a second clock rate by a second preselected increase in clock rate (see Bigjakkstaffa, page 6, which describes incrementing a memory clock rate of a graphics processing unit by dragging the memory clock slider up in preselected 10Mhz increments).

With regard to claim 30, Bigjakkstaffa describes means for selecting sets of overclocking parameters to test (see Bigjakkstaffa, page 6, wherein the user adjusts overclocking parameters by dragging the core clock and memory clock sliders up in 10Mhz increments); means for performing a graphical stress test for said sets of overclocking parameters; and means for determining safe overclocking parameters passing said graphical stress test; wherein said overclocking parameters comprise at least one of a graphics processor core clock rate and a graphics memory clock rate (see Bigjakkstaffa, pages 6 and 7, wherein the user clicks on the "test" button, and wherein further tests are performed by running a 3dmark bench, and if no visual artifacts or texture tearing appears, then the user defined GPU core and GPU clock speeds pass the test and are determined to be a safe set of overclocking parameters). The idea of

using the threshold and the like are covered by the rejection to claim 1, which is incorporated in its entirety by reference.

The rationale for modifying Bigiakkstaffa to cover the 'automatic' limitation is given above in the Response to Arguments section and is incorporated by reference.

With regard to claim 31, Bigjakkstaffa describes means for a user to initiate a request to select overclocking parameters (see Bigjakkstaffa, the overclocking menu tab on page 3, and see page 5, first paragraph, wherein the user requests overclocking by ticking the checkbox marked "Enable driver level hardware overclocking" near the top of the window) of at least one of a graphics processor and a graphics memory (see Bigjakkstaffa, pages 5 and 6, wherein the overclocking parameters to be evaluated are the clock of the GPU core and the clock of the GPU memory); means for selecting sets of overclocking parameters to test (see Bigjakkstaffa, page 6, wherein the user adjusts overclocking parameters by dragging the core clock and memory clock sliders up in 10Mhz increments); means for performing a graphical stress test for said sets of overclocking parameters; and means for determining safe overclocking parameters passing said graphical stress test wherein said overclocking parameters comprise at least one of a graphics processor core clock rate and a graphics memory clock rate (see Bigjakkstaffa, pages 6 and 7, wherein the user clicks on the "test" button, and wherein further tests are performed by running a 3dmark bench, and if no visual artifacts or texture tearing appears, then the user

defined GPU core and GPU clock speeds pass the test and are determined to be a safe set of overclocking parameters).

The rationale for modifying Bigiakkstaffa to cover the 'automatic' limitation is given above in the Response to Arguments section and is incorporated by reference.

The idea of using the threshold and the like are covered by the rejection to claim 1, which is incorporated in its entirety by reference.

With regard to claim 32, Bigjakkstaffa describes control panel means for displaying maximum safe overclocking parameters (see Bigjakkstaffa, pages 6 and 7, wherein the user clicks on the "test" button, and wherein further tests are performed by running a 3dmark bench, and if no visual artifacts or texture tearing appears, then the user defined GPU core and GPU clock speeds pass the test and are determined to be a safe set of overclocking parameters, and said safe overclocking parameters are displayed on the overclocking tab of the system tweaks control panel at page 9 of Bigjakkstaffa).

The rationale for modifying Bigiakkstaffa to cover the 'automatic' limitation is given above in the Response to Arguments section and is incorporated by reference.

The idea of using the threshold and the like are covered by the rejection to claim 1, which is incorporated in its entirety by reference.

Claims 18 and 22-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bigjakkstaffa, Bruno, Kao, and Gasior. As stated in the

previous Office Action, Gasior inherently is combinable with Bigiakkstaffa as below (e.g. Gasior teaches that the graphics card tested by Bigjakkstaffa has a graphics pipeline and other details of the hardware).

With regard to claim 18, Bigjakkstaffa, Bruno, and Kao are relied upon for describing all of the limitations of parent claim 17, as discussed in the 103(a) rejection above.

The references above do not explicitly teach counting pixel **bit** errors. However, textures and color dots do comprise pixels, and Bigjakkstaffa clearly teaches counting pixel errors. Now, applicant does not expressly define how a "pixel bit error" is different than a pixel error. Therefore, no applicant-specific definitions are found to be controlling in this situation, even in view of *Phillips v. AWH*. Next, the claims must be given the broadest reasonable interpretation with respect to the specification (*In re Morris*), which is necessarily broader and different than that given by courts. It has been held repeatedly by the CAFC that applicant's claims are not bound to the only disclosed embodiment in the specification but also **functional equivalents** and the like, even if means-plus-function language is not expressly included.

The added references – Bruno particularly – clearly teaches testing a system such that it can be overclocked up to the maximum safe threshold, as does Kao. Bruno continues to change parameters until the maximum safe threshold can be determined for overclocking purposes. That being said, Bruno at least suggests the idea of using a threshold. Now, in the case of Bigjakkstaffa, a human being determines the quantity of visual errors and determines what an

acceptable level of errors are. Even in light of applicant's Remarks on page 10, regardless of how subjective such a determination may be, the human being or user does in fact make such a determination. Now, the concept of using an objective threshold for such determinations is obvious in light of Bruno and Kao. Further, in light of *In re Venner*, the computer could obviously do the thresholding and judgment automatically, and **it** would make such judgments. Applicant's remarks overlook the fact that the human being in fact performs two roles.

Now, a pixel **bit** error can be quantified in many different ways. However, applicant's specification would seem to indicate that a pixel bit error could broadly be construed as an error in the pixel (e.g. a mis-rendered pixel with some indication (visually) that it was not correct). A pixel **bit** error would result in an incorrectly rendered pixel all the same (e.g. a pixel is standardly represented as 32 bit RGBA (8 bit red, 8 bit green, 8 bit blue, 8 bit alpha). Any error in those would result in the pixel being the wrong color or transparency, which would inherently constitute a pixel error. Indeed, a 'torn texture' or otherwise would still result in a **visually noticeable** defect of some kind –even if such a defect were only visible to a user with very high visual acuity without color-blindness. Such details – the amount of visual acuity and/or ability to see color – are quite beside the point in the interpretation of the Bigjakkstaffa reference, because the obviousness determination is not made with respect to whether or not a human user has some sort of disability or enhancement that would (not) allow such a user to detect visual errors – it is merely whether or not the reference **suggests**

such a limitation). Examiner believes those arguments to be misdirected for at least the above reasons.

Now, to the specific point of pixel bit errors, Bigjakkstaffa, Bruno, and Kao describes counting pixel bit errors (see Bigjakkstaffa, Bruno, and Kao, page 8, last paragraph, wherein the clock rate is incrementally increased to form a new set of overclocking parameters, and a stress test in the form of games and benchmarks are performed at the new clock rate, and further wherein when the test exceeds a preselected number of errors, in this case at least one such as a graphical glitch or a showing of colored dots/pixels, then the clock rate is no longer incremented), but fails to explicitly describe a graphics pipeline, as further recited in claim 18. However, Gasior teaches that the GeForce4 Ti 4200 graphics card tested by Bigjakkstaffa, Bruno, and Kao inherently has a graphics pipeline (see Gasior, page 1, fourth paragraph). The rationale for modifying Bigiakkstaffa to cover the 'automatic' limitation is given above in the Response to Arguments section and is incorporated by reference.

With regard to claim 22, Bigjakkstaffa, Bruno, and Kao teaches an overclocking control module for selecting and evaluating overclocking parameters (see Bigjakkstaffa, Bruno, and Kao, the overclocking menu tab on page 3, and see page 5, first paragraph, wherein the user requests overclocking by ticking the checkbox marked "Enable driver level hardware overclocking" near the top of the window of the overclocking control panel). Bigjakkstaffa, Bruno, and Kao fails to explicitly teach the remaining limitations of claim 22. However,

Gasior teaches that the GeForce4 Ti 4200 graphics card of Bigjakkstaffa, Bruno, and Kao has a graphics pipeline (see Gasior, page 1, fourth paragraph); and Kao teaches said graphics system configured to automatically test overclocking parameters and determine maximum safe overclocking parameters in response to a user request (see the Abstract of Kao).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify Bigjakkstaffa, Bruno, and Kao to incorporate the automatic overclocking test of Kao, since a graphics pipeline decreases rendering time over the single GPU of Bigjakkstaffa, Bruno, and Kao, and an automatic optimization test allows for increased user productivity and requires less user knowledge to perform the optimization.

The rationale for modifying Bigiakkstaffa to cover the 'automatic' limitation is given above in the Response to Arguments section and is incorporated by reference.

The idea of using the threshold and the like are covered by the rejection to claim 1, which is incorporated in its entirety by reference.

With regard to claim 23, Bigjakkstaffa, Bruno, and Kao teaches performing a stress test to evaluate errors generated by said graphics pipeline for each test set of overclocking parameters (see Bigjakkstaffa, Bruno, and Kao, the overclocking menu tab on page 3, and see page 5, first paragraph, wherein the user requests overclocking by ticking the checkbox marked "Enable driver level hardware overclocking" near the top of the window of the overclocking control panel, and see Bigjakkstaffa, Bruno, and Kao, pages 6 and 7, wherein the user

clicks on the "test" button, and wherein further tests are performed by running a 3dmark bench, and if no visual artifacts or texture tearing appears, then the user defined GPU core and GPU clock speeds pass the test and are determined to be a safe set of overclocking parameters) Bigjakkstaffa, Bruno, and Kao fails to explicitly describe an overclocking control module performing the stress test, as required by claim 23. However, Kao teaches an overclocking control module for performing said stress test (see the Abstract of Kao, wherein the frequency generator is the overclocking control module which performs an automatic stress/optimization test to automatically overclock a processing unit).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify Bigjakkstaffa, Bruno, and Kao to incorporate the automatic overclocking test and overclocking control module of Kao, since an overclocking control module performing an automatic optimization test allows for increased user productivity and requires less user knowledge to perform the optimization. The rationale for modifying Bigiakkstaffa to cover the 'automatic' limitation is given above in the Response to Arguments section and is incorporated by reference.

With regard to claim 24, Bigjakkstaffa, Bruno, and Kao teaches wherein said graphics system includes computer executable instructions for running a control panel program for selecting and evaluating overclocking parameters (see Bigjakkstaffa, Bruno, and Kao, the overclocking menu tab on page 3, and see page 5, first paragraph, wherein the user requests overclocking by ticking the checkbox marked "Enable driver level hardware overclocking" near the top of the

window of the overclocking control panel) and wherein said user inputs said request to said control panel (see Bigjakkstaffa, Bruno, and Kao, page 6, wherein the user adjusts at least one clock rate to form at least one new clock rate by dragging the core clock and memory clock sliders up in 10Mhz increments, and wherein the graphical user interface that the user is interacting with is inherently generated by computer executable instructions). Bigjakkstaffa, Bruno, and Kao fail to explicitly describe an overclocking control module, as required by claim 24. However, Kao teaches an overclocking control module (see the Abstract of Kao, wherein the frequency generator is the overclocking control module which performs an automatic stress/optimization test to automatically overclock a processing unit).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify Bigjakkstaffa, Bruno, and Kao to incorporate the overclocking control module of Kao, since an overclocking control module performing an automatic optimization test allows for increased user productivity and requires less user knowledge to perform the optimization.

With regard to claim 25, the Bigjakkstaffa, Bruno, and Kao/Gasior combination teaches wherein said graphics system determines a maximum safe GPU clock rate (see the Abstract of Kao, and see Bigjakkstaffa, Bruno, and Kao, page 8, last paragraph, wherein the clock rate of a GPU is incrementally increased to form a new set of overclocking parameters, and a stress test in the form of games and benchmarks are performed at the new clock rate, and further wherein when the test exceeds a preselected number of errors, in this case at

least one such as a graphical glitch or a showing of colored dots, then the clock rate is no longer incremented, instead, the clock rate is decremented and selected by the user to the last stable clock rate which is the maximum safe GPU clock rate).

With regard to claim 26, the Bigjakkstaffa, Bruno, and Kao/Gasior combination teaches wherein said graphics system determines a maximum safe memory clock rate of a graphics memory associated with said GPU (see the Abstract of Kao, and see Bigjakkstaffa, Bruno, and Kao, page 8, last paragraph, wherein the clock rate of the GPU memory is incrementally increased to form a new set of overclocking parameters, and a stress test in the form of games and benchmarks are performed at the new memory clock rate, and further wherein when the test exceeds a preselected number of errors, in this case at least one such as a graphical glitch or a showing of colored dots, then the memory clock rate is no longer incremented, instead, the memory clock rate is decremented and selected by the user to the last stable memory clock rate which is the maximum safe memory clock rate).

With regard to claim 27, the Bigjakkstaffa, Bruno, and Kao combined with Gasior combination teach wherein said graphics system determines a maximum safe GPU clock rate and a maximum safe memory clock rate of a graphics memory associated with said GPU (see the Abstract of Kao, and see Bigjakkstaffa, Bruno, and Kao, page 8, last paragraph, wherein the clock rate of a GPU and the memory rate of the GPU are incrementally increased to form a new set of overclocking parameters, and a stress test in the form of games and

benchmarks are performed at the new clock rates, and further wherein when the test exceeds a preselected number of errors, in this case at least one such as a graphical glitch or a showing of colored dots, then the GPU core and memory clock rates are no longer incremented, instead, the memory and GPU clock rates are decremented to the last stable clock rates which are the maximum safe GPU core clock rate and the maximum safe GPU memory clock rate).

Claims 8 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bigjakkstaffa, Bruno, and Kao as applied to claim 1, in view of Catenary Systems.

With regard to claim 8, Bigjakkstaffa, Bruno, and Kao and Gasior are relied upon for describing all of the limitations of parent claim 1, as discussed in the 103(a) rejection above. Bigjakkstaffa, Bruno, and Kao fail to explicitly describe writing to a three dimensional surface; performing an exclusive or operation; and determining uniformity, as recited in claim 8. However, official notice is hereby taken that writing to a three dimensional surface is notoriously well known in the art, and Catenary teaches performing an exclusive or operation and determining uniformity (see Catenary, page 1, wherein an XOR operation is performed on two images to determine their similarities or uniformity and differences).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify Bigjakkstaffa, Bruno, and Kao to incorporate the XOR operations and uniformity determination of Catenary Systems, because XORing two images generated by the graphics stress test of Bigjakkstaffa, Bruno, and Kao allows one to determine when the frequency of the GPU is set too high, as, for example, when two 3D generated test images are determined to be non-uniform by a predetermined percentage. The rationale for modifying Bigiakkstaffa to cover the 'automatic' limitation is given above in the Response to Arguments section and is incorporated by reference.

With regard to claim 19, Bigjakkstaffa, Bruno, and Kao are relied upon for describing all of the limitations of parent claim 12, as discussed in the 103(a) rejection above. Bigjakkstaffa, Bruno, and Kao fail to explicitly describe writing to a three dimensional surface; performing an exclusive or operation; and determining uniformity, as recited in claim 19. However, official notice is hereby taken that writing to a three dimensional surface is notoriously well known in the art, and Catenary teaches performing an exclusive or operation and determining uniformity (see Catenary, page 1, wherein an XOR operation is performed on two images to determine their similarities or uniformity and differences).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify Bigjakkstaffa, Bruno, and Kao to incorporate the XOR operations and uniformity determination of Catenary Systems, because XORing two images generated by the graphics stress test of Bigjakkstaffa, Bruno, and Kao allows one to determine when the frequency of the GPU is set

too high, as, for example, when two 3D generated test images are determined to be non-uniform by a predetermined percentage. The rationale for modifying Bigiakkstaffa to cover the 'automatic' limitation is given above in the Response to Arguments section and is incorporated by reference.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bigjakkstaffa, Bruno, and Kao in view of Fung.

With regard to claim 20, Bigjakkstaffa, Bruno, and Kao are relied upon for describing all of the limitations of parent claim 12, as discussed in the 102(a) rejection above. Bigjakkstaffa, Bruno, and Kao fails to explicitly describe sensing on-chip temperature; and in response to detecting a threshold temperature during stress testing, selecting a clock rate to maintain a chip temperature at or below said threshold temperature, as recited in claim 20. However, Fung teaches all of the limitations of claim 20 (see Fung, paragraph [0118], wherein frequency control registers are loaded with values used to control the clock frequency at which a CPU core runs, and a CPU temperature sensor 204 is also coupled to CPU 201 and is operative to modify the values stored in the frequency control registers in response to a sense to CPU temperature so that CPU temperature is maintained within acceptable operating limits).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify Bigjakkstaffa, Bruno, and Kao to incorporate the temperature sensing of Fung, because if the CPU temperature is not regulated as described in Fung, then the CPU or GPU could overheat and

malfunction as a result of the user-initiated overclocking of Bigjakkstaffa, Bruno, and Kao if the user selects an overly-high overclocking frequency. The rationale for modifying Bigiakkstaffa to cover the 'automatic' limitation is given above in the Response to Arguments section and is incorporated by reference.

Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bigjakkstaffa, Bruno, and Kao.

With regard to claim 28, Bigjakkstaffa, Bruno, and Kao teaches at least one function call instantiated in response to a control panel input to perform a stress test on each of a plurality of sets of overclocking parameters, each set of overclocking parameters including at least one element from the group consisting of a graphics processor core clock rate and a graphics memory clock rate (see Bigjakkstaffa, Bruno, and Kao, page 6, wherein the system tweaks control panel, specifically the overclocking tab, receives user input when the user drags the core clock and memory clock sliders to adjust at least one clock rate to form at least one new clock rate by dragging the GPU core clock and GPU memory clock sliders up in 10Mhz increments, and wherein the functional call is inherently instantiated by the system tweaks control panel of Bigjakkstaffa, Bruno, and Kao, otherwise the control panel would fail to operate). Bigjakkstaffa, Bruno, and Kao fails to explicitly describe said software driver module selecting overclocking parameters passing said stress test, as further recited in claim 28. However, Kao teaches said software driver module selecting overclocking parameters passing said stress test (see Kao, col. 2, lines 18-34, specifically the frequency

generators which use built-in parameters to automatically overclock a CPU of a computer system).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify Bigjakkstaffa, Bruno, and Kao to incorporate a software driver module selecting overclocking parameters passing said stress test, since an automatic optimization test allows for increased user productivity and requires less user knowledge to perform the optimization. The rationale for modifying Bigiakkstaffa to cover the 'automatic' limitation is given above in the Response to Arguments section and is incorporated by reference.

With regard to claim 29, Bigjakkstaffa, Bruno, and Kao teach a control panel for displaying overclocking parameters that include at least one of graphics processor core clock rate and a graphics memory clock rate said control panel instantiating a function call to said graphics system to test different overclocking parameters, set overclocking parameters, and return overclocking parameters to said control panel in response to a user selection (see Bigjakkstaffa, Bruno, and Kao, page 6, wherein the system tweaks control panel, specifically the overclocking tab, receives user input when the user drags the core clock and memory clock sliders to adjust at least one clock rate to form at least one new clock rate by dragging the GPU core clock and GPU memory clock sliders up in 10Mhz increments, and wherein the functional call is inherently instantiated by the system tweaks control panel of Bigjakkstaffa, Bruno, and Kao, otherwise the control panel would fail to operate). Bigjakkstaffa, Bruno, and Kao fail to explicitly describe permitting a user to select an automatic overclocking mode, as

also recited in claim 29. However, Kao teaches permitting a user to select an automatic overclocking mode (see the Abstract of Kao and col. 4, lines 19-22).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify Bigjakkstaffa, Bruno, and Kao to incorporate the user selected automatic overclocking mode of Bigjakkstaffa, Bruno, and Kao, since the automatic overclocking mode allows for increased user productivity and requires less user knowledge to perform the optimization. The rationale for modifying Bigiakkstaffa to cover the 'automatic' limitation is given above in the Response to Arguments section and is incorporated by reference.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bigjakkstaffa, Bruno, and Kao, in view of Tran.

With regard to claim 21, Bigjakkstaffa, Bruno, and Kao are relied upon for teaching all of the limitations of parent claim 12, as discussed in the 102(a) rejection above. Bigjakkstaffa, Bruno, and Kao fail to explicitly describe for each new core processor clock rate, selecting a chip operating voltage. However, Tran teaches all of the limitations of claim 21 (see Tran, col. 1, generally lines 36-56, specifically, lines 54-56).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify Bigjakkstaffa, Bruno, and Kao to incorporate the chip operating voltage selection of Tran, in order to avoid chip overheating or malfunction at increased clock speeds. Additionally, Kao teaches that modifying chip voltage is well known when attempting to overclock a processor.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Woods whose telephone number is 571-272-7775. The examiner can normally be reached on M-F 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on 571-272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Eric Woods

March 28, 2006

Ulka Chauhan

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